US-PAT-NO: 4127612

DOCUMENT-IDENTIFIER: US 4127612 A

TITLE: 19-Hydroxy PGE.sub.1 carbinol analogues

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Brief Summary Text - BSTX (24):
The compounds 19R-hydroxy PGE.sub.1 ; -PGE.sub.2 ; -PGF.sub.2.alpha. and PGF.sub.1.alpha. esters are naturally occurring and are the major prostaglandin components of human semen [FEBS Letters, 57, 22 (1975); Science, 187, 1093 (1975)]. A method for preparation of 19R-hydroxy-PGE.sub.1 methyl ester and PGE.sub.2 methyl ester is disclosed by J. C. Sih in Prostaglandins, 13, 830 (1977).

US-PAT-NO: 3862270

DOCUMENT-IDENTIFIER: US 3862270 A
See image for Certificate of Correction

TITLE: SECONDARY PHOSPHORIC ACID ESTERS

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Brief Summary Text - BSTX (4):
In the area of reproduction prostaglandins are involved in several ways. It is known, for instance, that sufficient amounts of prostaglandins to affect the female genital-tract smooth muscles are delivered with the semen and thereby probably promote conception. At full term the levels of prostaglandins in plasma and amniotic fluid are increased which in turn initiates the onset of labour. This latter effect of prostaglandins is presently being used therapeutically.

US-PAT-NO: 3953502

DOCUMENT-IDENTIFIER: US 3953502 A

TITLE: Cyclopentane derivatives

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Brief Summary Text - BSTX (1):

This invention relates to new cyclopentane derivatives, and in particular it relates to new cyclopentane derivatives which are analogues of the naturally occurring compounds known as prostaglandin F.sub.2 .alpha. and prostaglandin E.sub.2, showing a similar spectrum of pharmacological properties and being useful for similar purposes. The relative potency of the new compounds, however, in respect of the particular pharmacological effects shown is different from that of the above naturally occurring prostaglandins, and in particular they are more potent as luteolytic agents than the corresponding natural prostaglandins. That is to say, in general the prostaglandin F.sub.2 .alpha. analogues of the present invention are more potent than natural prostaglandin F.sub.2 .alpha., and the prostaglandin E.sub.2 analogues of the present invention are more potent than natural prostaglandin E.sub.2. The new compounds are, however, less potent as stimulants of uterine smooth muscle than the corresponding natural prostaglandins F.sub.2 .alpha. and E.sub.2, and are therefore more selective in respect of luteolytic activity than the natural prostaglandins. The new compounds are therefore advantageous when used as contraceptives, for the termination of pregnancy or for control of the oestrus

cycle, and are also useful as hypotensives or for the relief of bronchospasm, and as inhibitors of blood platelet aggregation or of gastric secretion. The new compounds of the invention are also useful for addition to semen intended for artificial insemination of domestic animals, the success rate of insemination being thereby increased, especially in pigs and cattle.

US-PAT-NO: 5402240

DOCUMENT-IDENTIFIER: US 5402240 A

TITLE: Sperm densimeter

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Brief Summary Text - BSTX (10):
It is important that the semen be protected from sunlight and that it be held at nearly constant animal body temperature from the time that it is collected until laboratory analysis is completed. All apparatus and containers that will come into contact with semen that is to remain viable must be clean and warmed to body temperature before use. A sample of a uniform mix of the collected gel-free semen is drawn and prepared for laboratory analysis. During analysis, the bulk of the semen should be stored in a stabilized incubator which has been preset to the proper temperature (38 degrees C. for equines). As soon as possible, however, the stored semen should be mixed with a pre-warmed life extending blend of chemicals and antibiotics (extender) in preparation for the insemination procedures which should immediately follow completion of the laboratory analysis. If the semen is to be shipped or used at a later time on-premises, the semen-extender mix must be cooled according to a prescribed program as a means of further increasing the sperm longevity. For some species, the semen may be cooled and maintained at refrigerated temperatures (5 degrees C.) for several days allowing safe shipping over long distances. Alternately, some species' semen can be frozen at cryogenic

temperatures (-196 degrees C.) and stored indefinitely.

US-PAT-NO: 5569581

DOCUMENT-IDENTIFIER: US 5569581 A

TITLE: Alteration and prediction of male fertility using seminal plasma and its components

---------- KWIC ---------

Brief Summary Text - BSTX (15):

By the way of background, semen consists of both sperm and seminal plasma. Male fertility is influenced by inherited factors directly associated with the sperm. Reports for several species suggest that seminal plasma contains factors which also influence male fertility. These studies were generally based on comparisons of seminal plasma composition between males of differing fertility [Constentino M. J., Emilson L. B. V., Cockett A. T. K., 1984, Prostaglandins in semen and their relationship to male fertility: A study of 145 men. Fertil Steril; Vol. 41, pp 88-94, Sandowski T., Rogers B. J., 1985, Two-dimensional electrophoretic patterns of seminal plasma proteins from fertile and infertile men. Biol Reprod, Vol. 32, (suppl 1), p 102, Jeyendran R. S., Van der vern H. H., Rosecrans R., Perez-Pelaez M., Al-Hasani S., Zaneveld L. J. D., 1989, Chemical constituents of human seminal plasma: Relationship to fertility. Andrologia, Vol. 21, pp 423-428, Panidis D., Rousso D., Pappas C., Kalogeropoulos A., 1991, Seminal plasma transferfin: does it help in the diagnosis of fertility. J. Obst. Gyn., Vol. 11, pp 211-214, Autiero M., Sansone G., Abreccia P., 1991, Relative ratios of lactoferrin.

albumin, and acid phosphatase seminal levels as sperm quality markers in
fertile and infertile men. J. Androl., Vol. 12, pp 191-200, Kandell R. L.,
Bellin M. E., Hajokins H. E., Ax R. L., 1992, Bull fertility was related to
distribution of heparin binding proteins in sperm membrane and seminal plasma.
J. Androl., Vol. 13(suppl 1), p 30,] or the isolation of factors from seminal
plasma which facilitate or inhibit sperm capacitation, fertilization, and
related events [Dukelow W. R., Cheinoff H. N., Williams W. L., 1967, Properties
of decapacitation factor and presence on various species. J. Reprod. Fert.,
Vol. 14, pp 393-399; Hunter A. G., Nornes H. O., 1969, Characterization and
isolation of a sperm coating antigen from rabbit seminal plasma with capacity
to block fertilization. J. Reprod. Fertil. Vol. 20, pp 419-427, Eng L. E.,
Oliphant G., 1978, Rabbit sperm reversible decapacitation by membrane
stabilization with a highly purified glycoprotein from seminal plasma. Biol.
Reprod., Vol. 19, pp 1083-1094, Reddy J. M., Stark R. A., Zaneveld L. J. D.,
1979, A high molecular weight antifertility factor from human seminal plasma.
J. Reprod. Fert.; Vol. 57, pp 437-446, Gaur R. D., Talwar G. P., 1975, Further
studies on the fertility promoting factor from human seminal plasma. Int. J.
Fertil., Vol. 20, pp133-136, Shivaji S., Bhargava P. M., 1987, Antifertility
factors of mammalian seminal fluid. BioAssays, Vol. 7 pp 13-17, Audhya T.,
Reddy J., Zaneveld L. J. D., 1987, Purification and partial chemical
characterization of a glycoprotein with antifertility activity from human
seminal plasma. Biol. Reprod. Vol. 36, pp 511-521, Miller D. J., Winer M.
A., Ax R. L., 1990, Heparin-binding proteins from seminal plasma bind to bovine
spermatozoa and modulate capacitation by heparin. Biol. Reprod., Vol. 42, pp

899-915].

US-PAT-NO: 6071689

DOCUMENT-IDENTIFIER: US 6071689 A
See image for Certificate of Correction

TITLE: System for improving yield of sexed embryos in mammals

---------- KWIC ---------

Detailed Description Text - DETX (36):
Angus heifers, 13-14 mo of age and in moderate body condition, were
synchronized with 25 mg of prostaglandin F-2 alpha at 12-day intervals and
inseminated 6-26 h after observed standing estrus. Freshly collected semen
from three 14-26 mo old bulls was incubated in 38 .mu.M Hoechst 33342 at
75.times.10.sup.6 sperm/ml in a TALP medium for 1 h at 34.degree. C. Sperm
were sorted by sex chromosomes on the basis of epiflourescence from laser
excitation at 351 and 364 nm at 150 mW using a MoFlo.RTM. flow cytometer/cell
sorter operating at 50 psi and using 2.9% Na citrate as sheath fluid. X
chromosome-bearing sperm (.about.90% purity as verified by resorting sonicated
sperm aliquots) were collected at .about.500 live sperm/sec into 2-ml Eppendorf
tubes containing 100 .mu.l Cornell Universal Extender (CUE) with 20% egg yolk.
Collected sperm were centrifuged at 600.times.g for 10 min and resuspended to
1.63.times.10.sup.6 live sperm/ml in CUE. For a liquid semen unsexed control;
Hoechst 33342-stained sperm were diluted with sheath fluid to 9.times.10.sup.5
sperm/ml and centrifuged and resuspended to 1.63.times.10.sup.6 progressively
motile sperm/ml in CUE. Sexed semen and liquid control semen were cooled to

5.degree. C. over 75 min and loaded into 0.25-ml straws (184 ul/straw).
Straws were transported at 3 to 5.degree. C. in a temperature-controlled
beverage cooler 240 km for insemination 5 to 9 h after sorting. Sexed semen
and liquid control semen were inseminated using side-opening blue sheaths
(IMV), one half of each straw into each uterine horn (3.times.10.sup.5 live
sperm/heifer). As a standard control, semen from the same bulls had been
frozen in 0.5-cc straws by standard procedures (mean 15.6.times.10.sup.6 motile
sperm/dose post-thaw), thawed at 35.degree. C. for 30 sec, and inseminated
into the uterine body. Treatments were balanced over the 3 bulls and 2
inseminators in a ratio of 3:2:2 inseminations for the sexed semen and two
controls. Pregnancy was determined ultrasonically 31-34 days after
insemination and confirmed 64-67 days later when fetuses also were sexed
(blindly). Data are presented in the table.

Detailed Description Text - DETX (40):
The objective was to determine pregnancy rates when heifers are inseminated
with extremely low numbers of frozen sperm under ideal field conditions. Semen
from three Holstein bulls of above average fertility was extended in
homogenized milk, 7% glycerol (CSS) extender plus 5% homologous seminal plasma
to 2.times.10.sup.5, 5.times.10.sup.5 or 10.times.10.sup.6 (control) total
sperm per 0.25 ml French straw and frozen in moving liquid nitrogen vapor.
Semen was thawed in 37.degree. C. water for 20 sec. Holstein heifers 13-15 mo
of age weighing 350-450 kg were injected with 25 mg prostaglandin F-2-alpha
(Lutalyse.RTM.) twice at a 12-day interval and inseminated with an embryo
transfer straw gun and side-opening sheath, half of the semen deep into each

uterine horn 12 or 24 h after detection of estrus. The experiment was done in
five replicates over 5 months, and balanced over two insemination technicians.
Ambient temperature at breeding was frequently -10 to -20.degree. C., so care
was taken to keep insemination equipment warm. Pregnancy was determined by
detection of a viable fetus using ultrasound 40-44 days post-estrus and
confirmed 55-62 days post-estrus; 4 of 202 conceptuses were lost between these
times. Day 55-62 pregnancy rates were 55/103 (53%), 71/101, (70%), and 72/102
(71%) for 2.times.10.sup.5, 5.times.10.sup.5 and 10.times.10.sup.6 total
sperm/inseminate (P<0.1). Pregnancy rates were different (P<0.05) among
bulls (59, 62, and 74%), but not between technicians (64 and 65%) or
inseminations times post-estrus (65% for 12 h and 64% for 24 h, N=153 at each
time). With the methods described, pregnancy rates in heifers were similar
with 5.times.10.sup.5 and 10.times.10.sup.6 total sperm per inseminate.

Detailed Description Text - DETX (49):
The objective was to determine pregnancy rates when heifers were inseminated
with very low numbers of sperm under ideal experimental conditions. Semen from
three Holstein bulls was extended in Cornell Universal Extender plus 5%
homologous seminal plasma to 1.times.10.sup.5 or 2.5.times.10.sup.5 sperm per
0.1 ml; 2.5.times.10.sup.6 total sperm per 0.25 ml was used as a control.
Fully extended semen was packaged in modified 0.25 ml plastic French straws to
deliver the 0.1 or 0.25 ml inseminate doses. Semen was cooled to 5.degree. C.
and used 26-57 h after collection. Holstein heifers 13-15 mo of age weighing
350-450 kg were injected with 25 mg prostaglandin F-2 alpha (Lutalyse.RTM.) at
12-day intervals and inseminated with an embryo transfer

straw gun and
side-opening sheath into one uterine horn 24 h after
detection of estrus.
Insemination was ipsilateral to the side with the largest
follicle determined
by ultrasound 12 h after estrus; side of ovulation was
verified by detection of
a corpus luteum by ultrasound 7-9 days post-estrus.
Pregnancy was determined
by detection of a fetus by ultrasound 42-45 days post
estrus. The experiment
was done in four replicates and balanced over three
insemination technicians.
Side of ovulation was determined correctly in 205 of 225
heifers (91%);
surprisingly, pregnancy rates were nearly identical for
ipsilateral and
contralateral inseminates. Pregnancy rates were 38/93
(41%), 45/87 (52%), and
25/45 (56%) for 1.times.10.sup.5, 2.5.times.10.sup.5 and
2.5.times.10.sup.6
sperm/inseminate (P>0.1). There was a significant
difference in pregnancy
rate (P<0.05) among technician, but not among bulls.
With the methods
described, it may be possible to reduce sperm numbers per
inseminate
sufficiently that sperm sorted by sex with a flow cytometer
would have
commercial application.

US-PAT-NO: 5983661

DOCUMENT-IDENTIFIER: US 5983661 A

TITLE: Container arrangement and method for transporting equine semen

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Detailed Description Text - DETX (6):
Use of an extender solution with semen processed for storage and transport is critical in its survivability. Extender provides nutrients to the sperm cells and contains antibiotics to destroy harmful bacteria. Because of reduced viability, it is believed that mares should be inseminated with 1 to 2 billion sperm cells and a volume of not more than 40 ml of semen. If a stallion has a sufficient concentration, the ejaculate may be split and several shipments obtained from a single collection. A further feature is the use of an extender that contains both sucrose and glucose. While the exact degree and mechanism by which the use of this type of dual sugar extender is effective in prolonging the life of the sperm during transit has not been determined with any certainty, is preferred over conventional single sugar types of extenders. The amount of extender used is also important. The preferred amount of dilution with the present invention is greater than with the prior art, and can be as high as 6:1 or more (e.g., 10:1). By way of example, a dual sugar semen extender that can be used in accordance with the present invention may be formulated, without limitation, as follows:

Detailed Description Text - DETX (8):

Examples of antibiotics that may be added to an extender used in accordance with the principles of the present invention include, without limitation, penicillin G, streptomycin, gentamicin sulfate, ticarillin, polymyxin B sulfate, etc. Penicillin G typically contains approximately 1600 units per milligram; thus, a typical quantity is about 625 mg. For each gram of solid material is used, approximately 1 cc of water is subtracted from that which is required to produce the final volume of 1000 cc. The inclusion of gram positive and gram negative antibiotics in the semen extender solution enhances the success of the insemination that is carried out after transportation to a destination. As previously mentioned, both of these types of microorganisms are found in the reproductive tracts of male and female horses, and the proliferation of such contaminating bacteria during transit can have a detrimental effect on the insemination, as well as lead to an abortion inducting infection in the recipient mare. In addition, adjustment of the pH and osmolality of the semen extender solution prior to mixing with the semen has the clear advantage of reducing the amount of time over which the delicate semen sample is exposed to deleterious effects.

Detailed Description Text - DETX (65):

For example, any suitable alternate gram positive and/or gram negative antibiotics may be used in the semen extender solution, as well as any effective broad spectrum antibiotic(s). In addition, security plastic strip 106a of the cardboard box could be replaced with a strip made of a different material. As yet another example, the box could be made of a material other

than cardboard, or a combination of cardboard and another material. As a further example, the ribbing/support/partition members in the bottom of the foamed plastic container need not necessarily extend the greater part of the length of the bottom of the rigid foamed plastic container, provided that (1) the plastic syringe(s) or other semen storage device(s) were held securely in position, and (2) the ports of the thermoregulating plate were appropriately "covered" to provide the requisite restriction for fluid communication between the upper and lower chambers of the bottom of the rigid foamed plastic container. In addition, the rigid foamed plastic container could be made of a material(s) different from that of the instant invention, provided that roughly similar insulating/heat transfer characteristics obtained for the final product and the above-described relatively slower cooling rate is not comprised. As an even further example, a semen extender solution with a composition different from that described herein (e.g., Kenny extender) could be used, provided the degree of dilution approximated a value or range of values that at least overlapped the range provided by the instant invention. As another example, storage and transport devices that are made of materials different from those disclosed herein would fall within the scope of the present invention, provided that they effectively promoted semen storage, including being sterile and containing no spermicidal compounds. As a final example, use of the instant invention for storage and transport of equine semen samples need not be so limited. Other biological (including semen from other animal sources) and non-biological samples requiring similar cooling rates and/or storage temperatures will benefit from practice of the disclosure herein. Furthermore,

the principles of the present invention can be applied to create similar
container arrangements, but with adaptations for the different cooling rate or
other parameter that is required to meet the needs of the particular biological
or non-biological product undergoing storage and/or transport.